Flatiron School

Data Science Course
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Module 2

Milestone Project
King County House Sales

Business Problem

Do home renovations might increase the estimated value of their homes?
By what amount?

Hypothesis

Does the renovation have an impact on the house price?
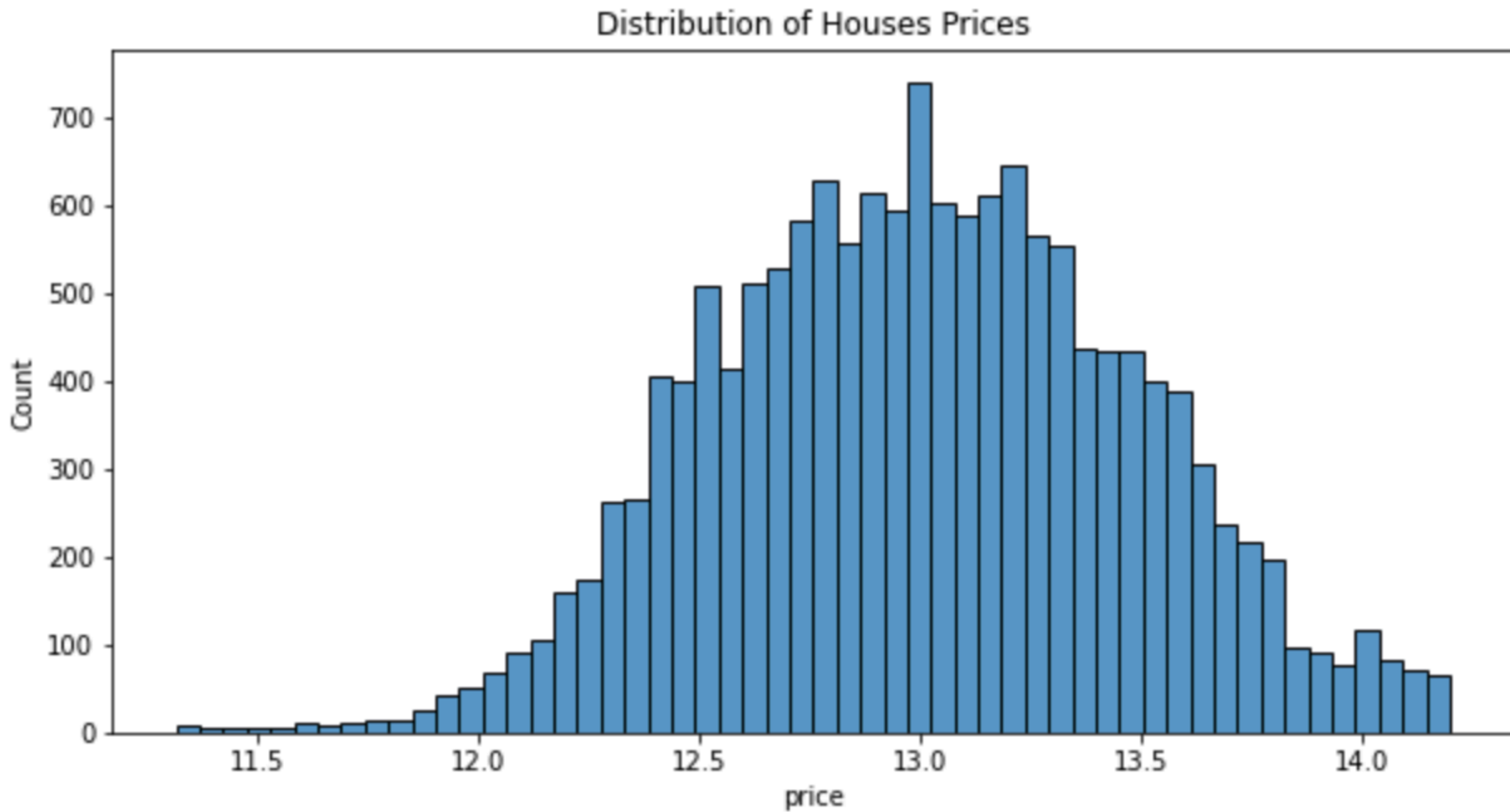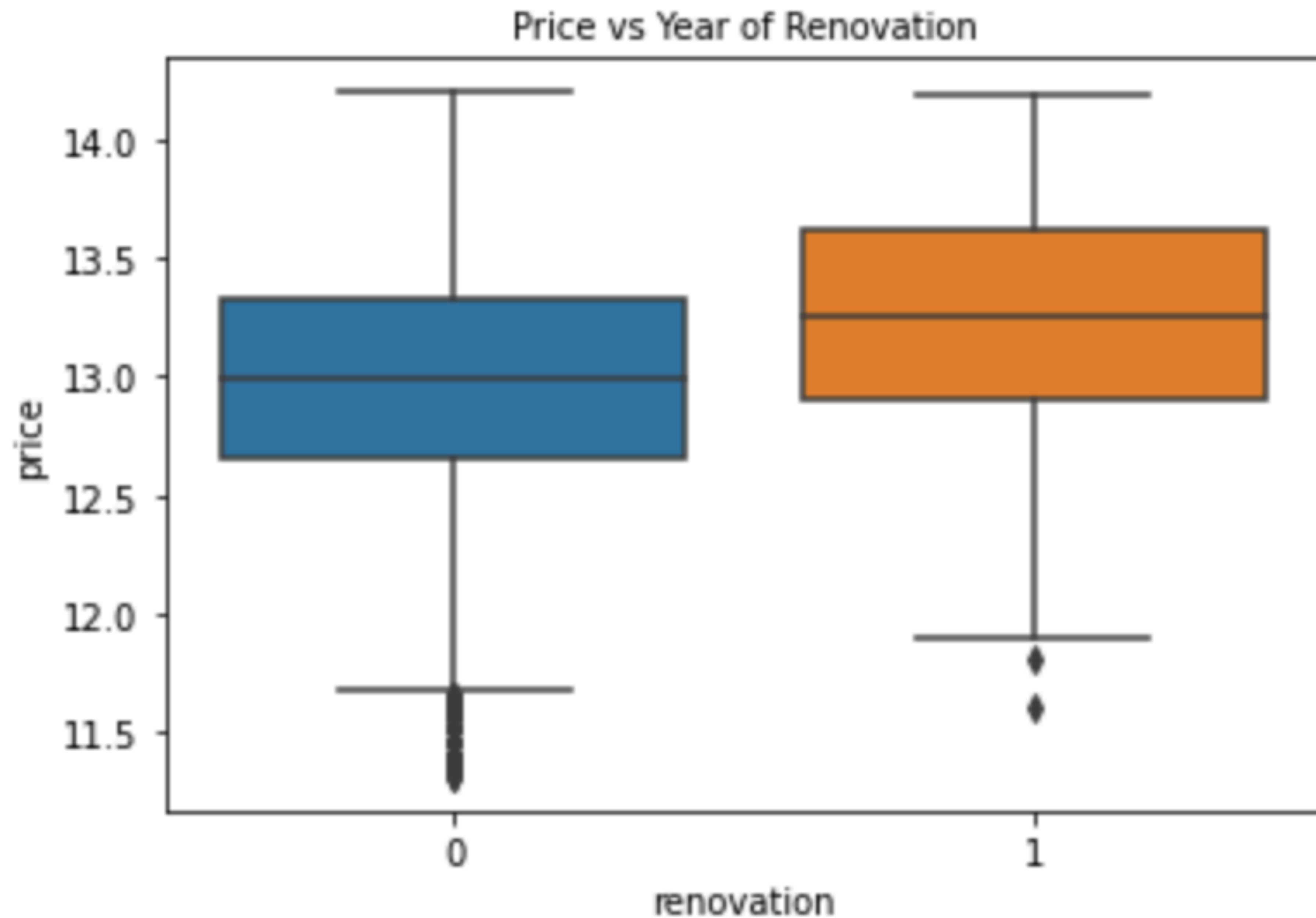
Dataset

- Source: King County House Sales

- Details:

  - Large dataset with 21957 entries spread on 21 columns

  - Some columns merit attention

Data Preparation

- Check for missing values and determine their treatment

- Check for outliers

- Data transformation techniques (log transformation, dummy variables)

Data Distribution

Price vs Year of Renovation

Results

- Based on the model and the statistical tests:

  - a house that has been renovated command an increase of 0.23% on the price, on average, holding all the other variable costant.

  - The results are statistically significant

  - Only 0.9% of the price is explained by the "renovation" feature

OLS Regression Results

Dep. Variable:	price	R-squared:	0.009
Model:	OLS	Adj. R-squared:	0.009
Method:	Least Squares	F-statistic:	131.4
Date:	Sun, 22 May 2022	Prob (F-statistic):	2.67e-30
Time:	23:40:50	Log-Likelihood:	-9966.4
No. Observations:	15029	AIC:	1.994e+04
Df Residuals:	15027	BIC:	1.995e+04
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	12.9994	0.004	3326.869	0.000	12.992	13.007
renovation	0.2278	0.020	11.464	0.000	0.189	0.267

Omnibus:	48.812	Durbin-Watson:	1.970
Prob(Omnibus):	0.000	Jarque-Bera (JB):	37.703
Skew:	-0.009	Prob(JB):	6.50e-09
Kurtosis:	2.755	Cond. No.	5.20

Considerations

- What about regression assumptions?

  - Binary variables don't violate regression assumptions

Further Research

- Correlations Results shows that most strongly correlated features worthy of further investigations are:

  - Living soft (sqft_living)

  - House conditions evaluated according to Washington state parameters (grade)

  - Living Sqft compared to the neighborhood (sqft_living15)

  - Number of bathrooms (bathrooms)

Houses Features Correlations
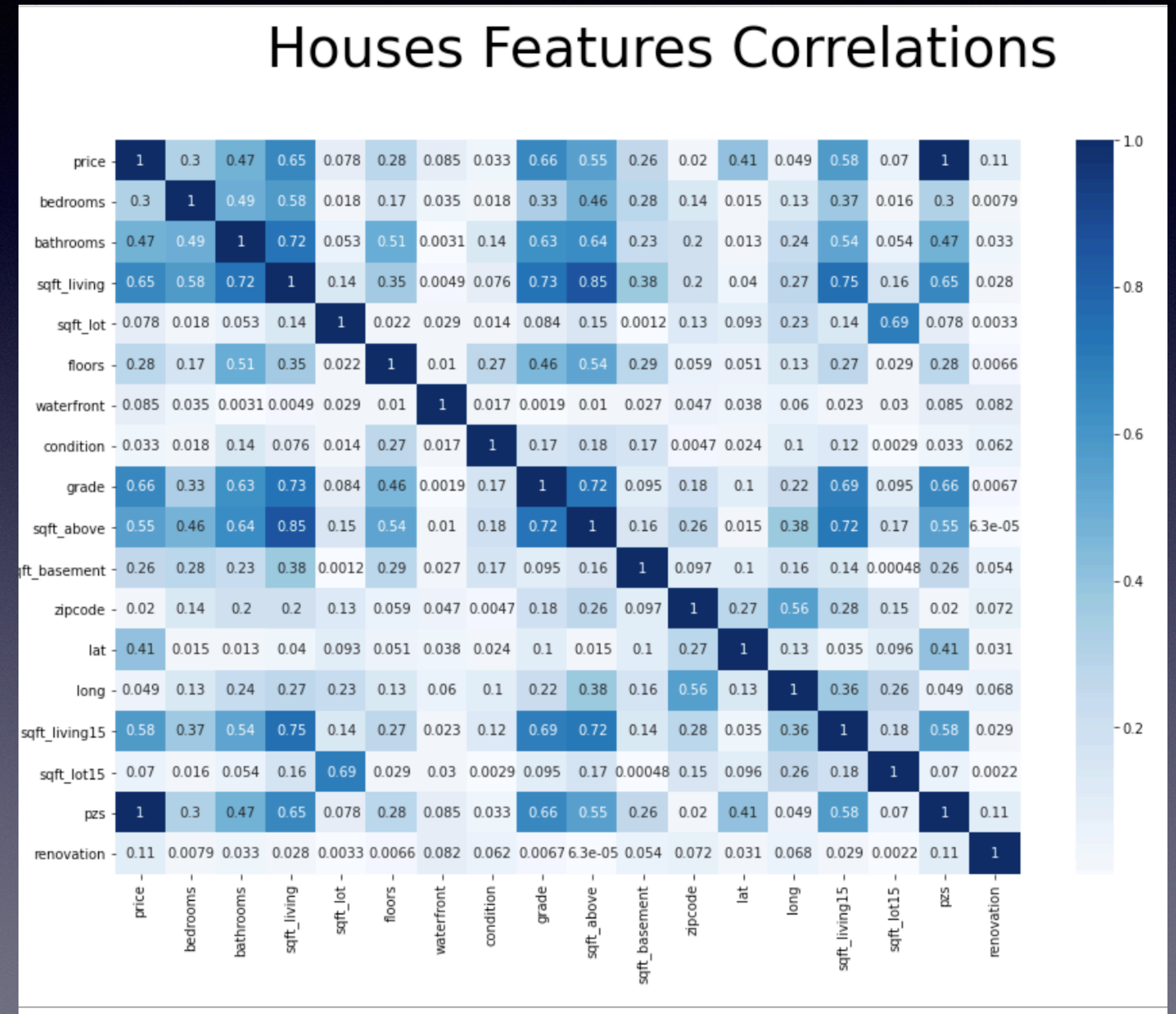
Conclusions

- Does having a house renovated is a lucrative feature?

  - The renovation feature slighly increases the price

  - The renovation itself is not among the features that considerabily impact the price.

  - Other features are more likely to have a major influence. These should be deeper investigated.

Q&A

Contacts

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Thank you!